

Selected Wildlife Toxicity Thresholds for Mercury

<u>ORGANISM</u>	<u>EVENT OCCURRENCE</u>	<u>EXPOSURE LEVEL</u>	<u>EFFECTS</u>	<u>REFERENCE</u>
<b>Fish</b> (General)	By maternal transfer	0.07 to 0.10 ppm	Embryo mortality in lake trout eggs Adverse effects on growth, development and hormonal status of early life stages	<a href="#">In BioDiversity Research Institute's "Mercury Connections"</a>
	In diet	0.88 to 8.46 ppm	Spawning success decreased in low, medium and high doses by 50% to 64%	
	In diet	0.959 ppm	Altered schooling movements	
	In diet	10 to 30 ppm	Acute toxicity	
Rainbow Trout ( <i>Oncorhynchus mykiss</i> )	Adult through spawning	0.26 to 0.49 µg/g ww	Significant reduction in alevin survival; significant increase in gross morphological abnormalities	<a href="#">In NOAA's "Mercury in Aquatic Habitats"</a>
	Eyed eggs-larvae	0.04 µg/g ww 0.3 0.9	55% mortality at 10 days 77% mortality at 10 days 100% mortality at 10 days	
	Embryo-larvae	0.07 µg/g ww 0.10	17-21% mortality at 4 days 100% mortality at 8 days	
	Fingerlings	10-30 µg/g ww 30-35	Decreased growth and appetite Darkened skin and lethargy	
	Fry-Juvenile	16-30 µg/g ww 26-68 20-28 19	Darkened skin; Loss in appetite; Visual acuity, and growth; Loss of equilibrium	
	Fingerlings	12-24 mg/g ww 19-24	Hyperpasia of gill epithelium Blood packed cell volume (PCV), growth	
	Subadult	7-32 µg/g ww 32-114 9-52	Decreased appetite and activity	
	Subadult	4-27 µg/g ww	Decreased appetite and activity	

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Fathead minnow ( <i>Pimephales promelas</i> )	Larvae-Adults and F1 larvae fed Artemia	1.2 µg/g ww 1.4 1.4	Retarded F0 larval growth (only at 30 days) Retarded F1 larval growth F0 reproductive inhibition and retarded growth	<a href="#">In NOAA's "Mercury in Aquatic Habitats"</a>
	Larvae fed dry food	1.3 µg/g ww 4.2	Retarded larval growth 50% mortality, spinal curvature, retarded larval growth	
Brook trout ( <i>Salvelinus fontinalis</i> )	3 generations continuously exposed	5 µg/g ww 8 3 3	No apparent effects	<a href="#">In NOAA's "Mercury in Aquatic Habitats"</a>
	3 generations continuously exposed	17 µg/g ww 24 12 5-7	Increased mortality, decreased growth, lethargy, and deformities in F1, no spawning	
	3 generations continuously exposed	2.2 µg/g ww	Deformed embryos; mortality at 3 weeks post hatching	
	3 generations continuously exposed	12.5 µg/g ww	Deformed embryos; no hatching	
Channel catfish ( <i>Ictalurus punctatus</i> )	Embryo-larvae	0.06 µg/g ww	Median lethal concentration at 4 days post-hatching	<a href="#">In NOAA's "Mercury in Aquatic Habitats"</a>
Walleye ( <i>Stizostedion vitreum vitreum</i> )	1 year old	3-6 µg/g ww 6-14 5-8	Emaciation; loss of locomotion, coordination and appetite	<a href="#">In NOAA's "Mercury in Aquatic Habitats"</a>
	1 year old	15-40 µg/g ww 18-50 15-45	88% mortality; emaciation; poor locomotion, coordination and appetite	
	Juveniles	0.25 µg/g ww 2.37	Impaired immune function, testicular atrophy, Impaired testicular development Impaired growth in males, testicular atrophy, Impaired testicular development	
Striped mullet ( <i>Mugil cephalus</i> )	Juveniles	0.3 µg/g ww 5.0	Inhibition of regeneration of amputated caudal fin	<a href="#">In NOAA's "Mercury in Aquatic Habitats"</a>
Grayling ( <i>Thymallus thymallus</i> )	Embryos exposed, tested 3 years later	0.27 µg/g ww 0.63 3.8	Reduced foraging efficiency and prey capture Reduced foraging efficiency and prey capture Reduced hatching, foraging efficiency and prey capture, and scoliosis, jaw deformities	<a href="#">In NOAA's "Mercury in Aquatic Habitats"</a>
Killifish ( <i>Fundulus heterclitus</i> )	Adults exposed, 2 generations followed	0.47 (F0) µg/g ww 1.0-1.1 (F0) 11-12 (F0)  0.01 µg/g ww 0.63	Reduced survival in F0 males Reduced survival in F0 males, altered sex ratio in F1 Reduced survival in F0 males, altered sex ratio in F1, reduced fertilization success in F1 Altered sex ratio in F1 Altered sex ratio in F1, reduced fertilization success in F1	<a href="#">In NOAA's "Mercury in Aquatic Habitats"</a>

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Birds	In diet	.01 to 0.16 ppm	Fewer eggs produced Lower reproductive success Offspring less responsive to maternal calls Lower reproductive success in wild common loons	<a href="#">In BioDiversity Research Institute's "Mercury Connections"</a>
	In eggs	0.5 to 5.5 ppm	Reduced Hatchability Reduced chick survival Decreased egg volume Compromised embryonic development	
	In diet	0.5 ppm	Less likely to hunt, seek shade Less time flying, walking or pecking Increased time preening Exaggerated response to fright stimulus	
	In diet	5.0 ppm	Brain lesions; Spinal Cord degeneration; Central nervous system dysfunction; Tremors; Difficulty flying, walking and standing; Inability to coordinate muscle movement; Reduced feeding, weight loss; Progressive weakness in	
	In diet	0.5 to 5.0 ppm	Lower packed cell volume Greater bone marrow cellularity Increased perivascular edema in lung	
	In blood	3.0 ppm	Decreased nest attendance; Lower reproductive success; Increased feather asymmetry; Disrupted hormone levels; Decreased egg volume	
Mink & Otter	In diet	1.1 ppm	Neural necrosis leading to impairment of sensory and motor skills	<a href="#">In BioDiversity Research Institute's "Mercury Connections"</a>
	In diet	1.8 ppm	Anorexia, weight loss	
	In diet	1.8 to 5.0 ppm	Acute toxicity leading to death	
	In fur	20 ppm	Sublethal toxicity in the wild	
	In fur	47 ppm	Acute toxicity in the wild	